

Appl. No. 09/871,993

Amdt. dated July 11, 2003

Reply to Office Action of April 9, 2003

Amendments to the Specification:

Please replace the paragraph extending from page 2, line 20 to line 24, with the following rewritten paragraph:

--Additionally, during the manufacturing process of the image sensing chip, the largest problem resides at the incapability of controlling the moisture and dust particles, which impact the chip's sensitivity, affect the quality of the normal received ~~image~~ image, and lower the yield rate of the product.--

Please replace the paragraph extending from page 6, line 4 to page 7, line 4, with the following rewritten paragraph:

--Firstly, as shown in figure 3, the present invention has to achieve the automation for the manufacturing process of the image sensing chip 10, as shown in figure 1. The Trays similar to tray 20, as shown in figure 2 ~~is~~ are used. Such tray 20 has a plurality of accommodating grooves 21, and each accommodation groove 21 penetrates the tray 20, and the surface area of the upper opening is approximately equal to that of the image sensing chip 10 and the surface area of the lower opening is slightly smaller than that of the upper opening, so that each of the same type of components (glass board 11, carrier 12, and printed circuit board 13) are accommodated into individual trays for processing. Hereafter, the description of the specification will use the following terms "main tray", "first tray" and "second tray" without numbering to indicate trays similar to the tray 20. Please take the present invention for example, a plurality of printed circuit boards 13 are placed into a main tray (because it is unnecessary to remove the print circuit board 13 during the entire manufacturing process), a plurality of carriers 12 into a first tray, and a plurality of glass plates 11 into a second tray. In addition, to attain the automation for the process, the tray 20 also has a chip adhering mark 22 being disposed on a lateral side of the chip, and a

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conductive wire adhering mark being disposed on the corresponding side. Therefore, the tray 20 can be fixed in position by means of the chip adhering mark 22 and the conductive wire adhering mark 23 in the chip adhering step and the conductive wire adhering process. The entire manufacturing process can be accomplished by using the same tray 20. Of course, the tray 20 is not limited to the use for the PLCC packaging process, but it can be applied to the CLCC manufacturing process or other packaging process. --

Please replace the paragraph extending from page 8, line 20 to page 10, line 10, with the following rewritten paragraph:

-- Figure 5 shows the block diagram of the manufacturing procedure of the image sensing chip 10. The printed circuit board 13, the carrier 12, and the glass plate 11 are put into the main tray, the first tray, and the second tray as in Steps 41, 42, and 43 respectively to proceed with the packaging process for the image sensing chip. To further elaborate the implementation of the embodiment of the present invention, please refer to figure 5 again, after putting the printed circuit board 13 into the main tray first, we perform the foregoing rinsing process 30, and then perform the dispenser process 44 on the printed circuit board 13. The dispensing method could be gluing, silkscreen, or other method. After putting the carrier 12 into the first tray, we proceed with the foregoing rinsing process 30, and then performing the step 421 to take each carrier 12 to the main tray either manually or by vacuum. After each carrier 12 is placed and fixed in the corresponding printed circuit boards 13 on the tray, proceed with the thermal pressing step 45, chip adhering step 46, and conductive wire mounting step 47; wherein the temperature and pressure for the pressing step 45 is in the range from 60°C to 200°C. and from 2 Kg/cm² to 8 Kg/cm² respectively, and the time for the thermal pressing is from 0.5 to 500 minutes. The chip

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adhering step 46 may use silver adhesive as the adhering material and the conductive wire adhering may use gold wire, aluminum wire, or ~~cupper~~ copper wire as the adhering material. It is worth to notice that low temperature cooling (-40°C by means of carbon dioxide), nitrogen gas blowing, and baking for removing moisture and impurities can be performed upon the semi-finished goods during chip adhering step 46. Since the tray 20 can carry 30 to 50 pieces of carriers and printed circuit boards at a time, therefore the manufacturing process of the present invention can finish 30 to 50 pieces of image sensing chip 10 at a time, and hence increases the manufacture efficiency drastically. Please continue to refer to Figure 5 for the manufacturing process of the present invention. After the glass plate 11 is put into the second tray, we proceed with the foregoing rinsing process 30. Since there will be no organic matter attached on the glass plate 11, therefore we can skip the defatted rinsing 31 step and just include the steps of pure water rinsing 32, hot pure water rinsing 33, fan-bladed drainage 34, baking 35, cooling 36, and static electricity removal 37. Then proceed with the dispenser process 431 on the glass plate 11, and the dispenser method could be gluing, silkscreen, or other method. Then we proceed with the overturning step 432 for each glass plate 11, so that the surface with the dispenser faces downward, and we can go ahead with the step 433 by taking it to the main tray either manually or by vacuum. Since the dispenser faces down, therefore the glass plate 11 can be directly aligned to the main tray for the glass adhering step 48.--